Abstract of the Disclosure

The present invention provides a method of depositing a cladding layer over external surfaces of a waveguide structure formed on a planar substrate, the waveguide structure comprising a planar waveguide core formed on the planar substrate and a raised structure formed on the planar substrate adjacent the waveguide core. The invention allows high-aspect-ratio gaps in a planar optical waveguide structure to be filled without incorporating macroscopic or microscopic voids. In one embodiment, the method comprises depositing a cladding material over the planar waveguide structure, etching the deposited cladding material so as to reduce shadowing effects between the waveguide core and the raised structure during the deposition of the cladding material, and controlling at least one parameter of the deposition so as to form a cladding layer from the deposited material. In another embodiment, the method involves modifying the profile of the waveguide structure before depositing the cladding layer.